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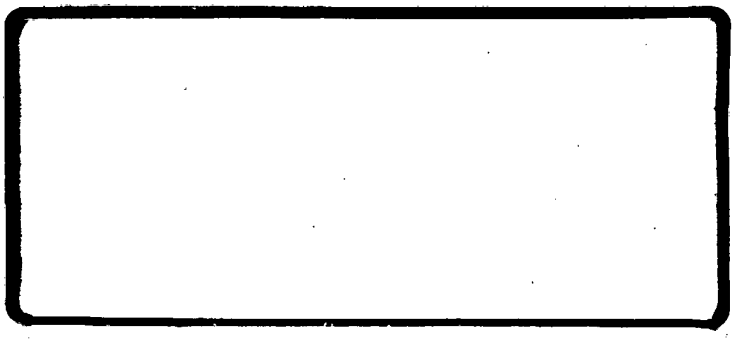

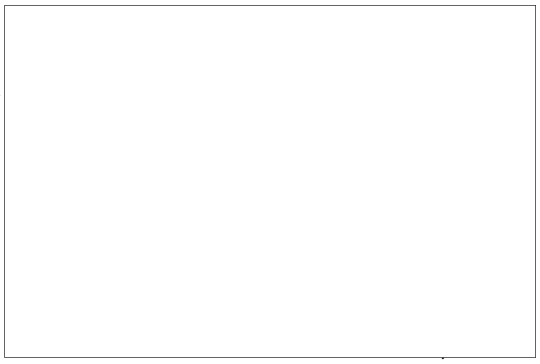

STAT

STATUS REPORT

for period

1 August through 31 August 1970

U. S. GOVERNMENT

[redacted] STAT

File No. 11038

[redacted] STAT

This document is presented as the Monthly Status Report under Contract to the U. S.

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The report period represented herein covers the period 1 August through 31 August 1970.

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INDEX

PROGRAM STATUS SUMMARY

Scheduled percentage of completion 98.3%

Actual percentage this date 93.3%

The work of assembling the Stereocomparator has reached the point of integration of the computer program with the mechanical, electrical, and optical subsystems. Certain problems have developed which are mentioned in this report.

While these problems have not been solved at this time, work is proceeding, and no setbacks to the Stereocomparator schedule are presently contemplated.

TASK 1

STATEMENTS of WORK, SPECIFICATIONS, REPORT PREPARATION

Scheduled percentage of completion	100%
Actual percentage this date	100%

As an aid in preparing the acceptance test procedures, the performance specifications for the Stereocomparator are presently being reviewed with the object of updating them.

TASK 11

STAGE DRIVES

Scheduled percentage of completion	100%
Actual percentage this date	97%

Accelerometer readings taken at various points on the Stereocomparator substructure during the approximately 20 Hz. vibration has shown that vibration of the stage on one side of the instrument reflects and shows up as vibration of the stage on the other side of the instrument. Work is continuing to determine if the base of the instrument is vibrating as a whole.

The [redacted] vibration absorbing system has proved to be a problem. It does eliminate vibration from the ground to the Stereocomparator, but it is not sufficiently damped to prevent excursions when the Stereocomparator mechanical system is excited. STAT

The addition of viscous damping devices between the Stereocomparator frame and the ground (around the [redacted] units) is presently under study. [redacted] has been retained as a consultant to assist in the design of this equipment. STAT STAT

In the event that a damping device does not completely cure the problem, it may be necessary to stiffen the connection between the stages and the granite base blocks through modifications to the threadless lead screw stage drive units.

TASK 16, 17, and 18

VIEWING OPTICS

and VIEWING ILLUMINATION

Scheduled percentage of completion	100%
Actual percentage this date	100%

The task of optical alignment and checkout is continuing. The optical assembly and preliminary alignment is complete. The optical systems are in process of fine alignment adjustment to maximize the resolution and generally improve the image quality.

TASK 22

INTERFEROMETER ASSEMBLY

Scheduled percentage of completion	100%
Actual percentage this date	75%

An improved interferometer design was breadboarded. The new design uses birefringent material, specifically a Rochon prism, and half and quarter wave plates, to eliminate the return beam to the laser. This means that the interferometer light path can be short and direct without the problem of a return beam interfering with the operation of the laser internal servo system. In addition, the short path will reduce the possibility of flicker of the beam due to air refraction.

The final design has been laid out and is ready for detailing. It is expected to be ready for installation when the present software checkout phase is complete.

TASK 36

OVERALL ASSEMBLY

Scheduled percentage of completion	100%
Actual percentage this date	90%

The overall assembly of the Stereocomparator is essentially complete except for the exterior skin. The equipment is presently in its final adjustment and debugging phase.

TASK 40

INSTALLATION

Scheduled percentage of completion	100%
Actual percentage this date	20%

In the recent inspection of the customer's installation site, it was noted that the upper cable tray on the left-hand side of the Stereocomparator interfered with access for service for the left side main illumination system. Drawing No. E8235B has been revised and transmitted to the customer. This drawing shows the suggested relocation of the interfering cable tray as outlined above.

There is the possibility that modifications will be required to the vibration absorption system beneath the structural steel main frame of the Stereocomparator. It is assumed that these changes can be made without significant conflict with the installations beneath the computer floor at the installation site.

TASK 43

COMPUTER PROGRAMMING and SERVICES

Scheduled percentage of completion	100%
Actual percentage this date	93%

STAT [redacted] report on the status of the computer program effort for the Stereocomparator is included in the pages following. Their work of integration and computer program test is well underway; however, a very substantial effort is required before the programming system can be considered complete and satisfactory.

EXCERPTS from [redacted] STAT

MONTHLY PROGRESS REPORT

July, 1970

1. Work on this project was suspended while the Stereocomparator hardware assembly was being completed. In the last week of the month, work was started on the software changes for the expansion of core from 16 to 32K words.

The attached diagram shows the layout of core that is planned now that the 32K word memory is available.

There are two modes of operating in the 32K environment: extend and non-extend. Extend mode allows access to all 32K of core, while non-extend mode allows a program access only to the half of core it is resident in. Since Fortran-coded routines have no control over their own mode of operation, they have been put into upper core, where they can access Common in the non-extend mode. Since DAP-coded routines can control their mode, they

can reside in lower core and still access Common (in the extend mode). Certain DAP-coded routines are used by both Fortran and DAP-coded drivers; so these must go in upper core where they will be accessible to Fortran in non-extend mode. Certain library routines are used by both Fortran and DAP routines; so for the same reason must go into a special sector of high core.

2. During August, the accommodation of the software to the 32K environment will be completed. The final integration of the Stereocomparator program will then begin.

3. At this time there exist no pending unresolved technical problems.

The programming for the project is 85% complete at this time.

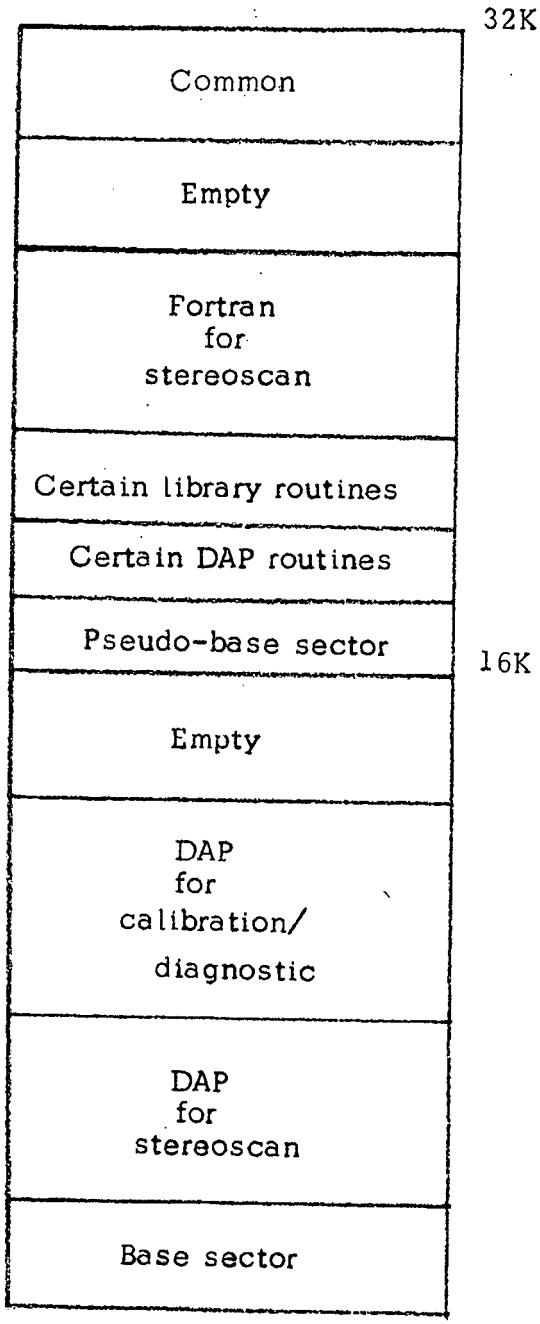

Figure 1. Core Layout for 32K